REMARKS

The Office action has been carefully considered. The Office action rejected claims 1-2, 4, 9-20, and 25-26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,553,222 to Milne et al. ("Milne"). Further, the Office action rejected claims 3, 27, and 28 under 35 U.S.C. § 103(a) as being unpatentable over Milne in view of U.S. Patent 6,731,314 to Cheng et al. ("Cheng"). Further yet, the Office action rejected claims 5-8, 21-24, and 30-36 under 35 U.S.C. § 103(a) as being unpatentable over Milne in view of U.S. Patent 5,986,675 to Anderson et al. ("Anderson"). Finally, the Office action rejected claim 29 under 35 U.S.C. § 103(a) as being unpatentable over Anderson. Applicants respectfully disagree.

By present amendment, claims 1, 18, and 29 have been amended for clarification and not in view of the prior art. Applicants submit that the claims as filed were patentable over the prior art of record, and that the amendments herein are for purposes of clarifying the claims and/or for expediting allowance of the claims and not for reasons related to patentability. Reconsideration is respectfully requested.

Applicants thank the Examiner for the interview held (by telephone) on February 16, 2006. During the interview, the Examiner and applicants' attorney discussed the claims with respect to the prior art. The essence of applicants' position is incorporated in the remarks below.

Prior to discussing reasons why applicants believe that the claims in this application are clearly allowable in view of the teachings of the cited and applied references, a brief description of the present invention is presented.

The present invention is directed to a system for generating timing intervals for use with components that deal with computer graphics animation. In general, high-level components typically maintain a set of clocks (sometimes referred to as timelines) related to animated objects in a scene, or media such as linear audio and/or linear visual media. These clocks often correspond to clock properties received from one or more application programs, and may be hierarchically arranged.

These clock properties may be modified by source events comprising interactive control events initiated by the application at run-time. Thus, the clocks are interactive, in that each clock can be individually started, paused, resumed and stopped at arbitrary times by the application, *e.g.*, in response to user input. In addition, new clocks can be added to the timing structure, and existing clocks can be removed.

One factor that typically influences the run-time of the timing update operation is the interaction of various synchronization rules. Because the time required to update the clocks is proportional to the number of clocks involved, the present invention converts a clock representation based on relational synchronization primitives to a representation based on independent intervals. As a result, to achieve predictable run-time behavior, a low-level timing engine is able to treat its clocks as independent entities. To this end, a high-level timing component may then generate an interval list for each clock based on a stored list of events (begin, pause, and so forth) and the associated synchronization primitives. The activation intervals are straightforward, non-overlapping segments

that describe the time expressed by a given clock at different points in time, for example. The clocks may be processed via event lists at the higher level, from which timing interval data may be generated and passed (*e.g.*, in data structures) to various low-level components. One or more low-level components may use the timing interval data to rapidly calculate (*e.g.*, per-frame) values corresponding to animation changes.

With this high-level / low-level hierarchy established, the lower-level component may calculate a current progress value for an object being animated, based on a current time within the current interval for any given frame. From the progress data, one or more property values of the animated object, such as current position, angle of rotation, color, and/or essentially any transformable property, may be rapidly interpolated for the current frame.

Any time that the user or some automated process interacts with the application program in a manner that affects an animation, such as to pause the contents of a displayed window that includes animations, or restart an animation, the higher level component re-computes the event list for the relevant clock and for any child clock or clocks thereof in the hierarchy. This re-computing operation may include adding implicit events to the event list, and/or designating some events as unused. The animation intervals are also recomputed from the event list and sent to the lower-level engine, which in turn consumes these intervals and adjusts each animated object's values accordingly for the display frame being constructed based on the updated animation interval list for that object.

Note that the above description is for example and informational purposes only, and should not be used to interpret the claims, which are discussed below.

Turning to the claims, amended claim 1 recites, in a computing environment, a system comprising a first component that receives clock data from a program, an interval generation mechanism that computes interval data based on the clock data, wherein the interval data corresponds to a relative determination of time between a first event and a second event, and a second component that receives the interval data and determines an output based on the interval data and current time data.

The Office action rejected claim 1 as being unpatentable over Milne. Specifically, the Office action contends that Milne teaches a first component that receives clock data from a program. Fig. 10 and Fig. 5 of Milne are referenced. Further, the Office action contends that Milne teaches an interval generation mechanism. Fig. 2 of Milne is referenced. Still further, the Office action contends that Milne teaches a second component that receives the interval data and determines an output. Again, Fig. 10 and Fig. 5 of Milne are referenced.

The Office action acknowledges that Milne fails to teach handling current time data. However, the Office action contends that Milne teaches this concept at Fig. 3, citing the system timer. The Office action concludes that the recitations of claim 1 would have been obvious to a person skilled in the art at the time the invention was made because more accurate, up-to-date, time information allows for additional capabilities in the system. Applicants respectfully disagree.

To establish *prima facie* obviousness of a claimed invention, all of the claim recitations must be taught or suggested by the prior art; (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)), and "all words in a claim must be considered in judging the patentability of that claim against the prior art;" (*In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)). Further, if prior art, in any material respect teaches away from the claimed invention, the art cannot be used to support an obviousness rejection. *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed Cir. 1997). Moreover, if a modification would render a reference unsatisfactory for its intended purpose, the suggested modification / combination is impermissible. See MPEP § 2143.01.

Applicants submit that the Office action has failed to establish a *prima facie* case for obviousness. Not all of the recitations of claim 1 have be shown to be taught or suggested by the prior art of record. Furthermore, claim 1 has been amended to further distinguish that which applicants regard as their invention over the prior art.

Milne is directed, generally, toward an external synchronization system that provides timing information to several multimedia systems simultaneously. In specific, the system of Milne allows several different devices, such as a device associated with player A and a device associated with player B, as generally described in Fig. 10, to be triggered by the same timing device. The timing device may be divided down via clock objects that provide appropriate timing data to various multimedia devices (*i.e.*, a CD player, a MIDI keyboard, a computer-enabled music-playback device, *etc.*). Although Milne teaches a system for

providing various timing data to various devices, Milne cannot distinguish between timing data and interval data as Milne is not even cognizant of the concept of interval data.

In contrast, claim 1 recites an interval generation mechanism that computes interval data based on the clock data. Interval data is different from general timing data, as interval data describes non-overlapping segments of time as expressed by a given clock a different points in time. That is, the actual timing unit of measure is irrelevant as the interval between events is measured as a difference between the measure at the first event and the measure at the second event. For example, a particular system may have a timing system that utilizes a clock that has a rate of X cycles per second, where X is irrelevant to the system of the invention. As events occur in time, *i.e.*, at the Y cycle or at the Z cycle, a measure between the Y and the Z cycle may be expressed as an interval. Thus, regardless of when events occur, the difference in time between two events may be expressed as an interval. Milne fails to teach or even suggest anything that may be construed as an interval.

Furthermore, claim 1 has been amended to recite that the interval data corresponds to a relative determination of time between a first event and a second event. Certainly Milne cannot distinguish between standard timing data which is only relative to itself, *e.g.*, ½ second is half as long as 1 second, and interval data which is relative to an event, *e.g.*, event A occurs three clock cycles before event B. Milne does not teach or suggest a system capable of determining time between a first event and a second event as recited in claim 1. For at least these reasons, applicants submit that claim 1 is allowable over the prior art of record.

Applicants respectfully submit that dependent claims 2-17, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 1 and consequently includes the recitations of independent claim 1. As discussed above, Milne fails to teach or suggest all of the recitations of claim 1 and therefore these claims are also allowable over the prior art of record. Even when additional prior art is introduced, such as the case with Cheng and Anderson, the prior art of record, whether considered as individual references or in any permissible combination with each other, still fails to teach or suggest the recitations of claim 1. In addition to the recitations of claim 1 noted above, each of these dependent claims includes additional patentable elements.

For example, claim 9 recites system of claim 1 wherein the clock data comprises property information corresponding to a begin time value and a duration. Milne may teach that clock data describes a begin time value regarding an event. However, Milne is completely silent with respect to determining anything about the duration of an event with respect to another event, such that other events may be relative to the duration of the initial event. For at least this additional reason, applicants submit that claim 9 is allowable over the prior art of record.

Turning to the next independent claim, amended claim 18 recites in a computing environment, a method comprising receiving clock data, generating interval data based on the clock data, wherein the interval data corresponds to a relative determination of time between a first event and a second event, and causing output to be produced based on current time data and the interval data.

The Office action rejected claim 18 as being unpatentable over Milne. More specifically, the Office action cited the same sections of Milne and presented the same rationale for rejection as was presented previously with respect to claim 1. Applicants respectfully disagree.

Again, applicants submit that the Office action has failed to establish a *prima facie* case for obviousness. Not all of the recitations of claim 18 have be shown to be taught or suggested by the prior art of record. Furthermore, claim 18 has been amended to further distinguish that which applicants regard as their invention over the prior art.

As discussed above, Milne teaches, generally, a system of method for using timing data to synchronize the occurrence of different events on different connected devices. However, Milne cannot determine anything about the occurrence of events not under the control of its system. That is, the timing system of Milne causes events to occur at specific points in time, but if an event occurs not specifically controlled by the timing system of Milne, Milne is wholly unaware of the event's occurrence. Thus, Milne is merely an example of an external synchronization device that is capable of providing non-relative timing information to several devices.

In contrast, claim 18 recites generating interval data based on the clock data. That is, the method of claim 18 is able to recognize the occurrence of an event and determine a specific interval of time that has passed relative to the occurrence of a previous event. Information about this passage of time is called interval data and it is a concept of which Milne is not even cognizant. Furthermore,

claim 18 has been amended to recite that the interval data corresponds to a relative determination of time between a first event and a second event. Milne teaches a synchronization device that causes events to occur in connected devices based on providing timing data to these devices that have events that need to be triggered. In contrast, claim 18 is directed to a method for determining an interval between the occurrences of two events not triggered by a timing system. That is, Milne cannot be construed to teach or suggest interval data that corresponds to a relative determination of time between a first event and a second event because the system of Milne merely triggers events and cannot recognize the event's occurrence. For at least these reasons, applicants submit that claim 18 is allowable over the prior art of record.

Applicants respectfully submit that dependent claims 19-26, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 18 and consequently includes the recitations of independent claim 18. As discussed above, Milne fails to teach or suggest all of the recitations of claim 18 and therefore these claims are also allowable over the prior art of record. Even when additional prior art is introduced, such as the case with Cheng and Anderson, the prior art of record, whether considered as individual references or in any permissible combination with each other, still fails to teach or suggest the recitations of claim 18. In addition to the recitations of claim 18 noted above, each of these dependent claims includes additional patentable elements.

Turning to the next independent claim, claim 27 recites a computer-readable medium having stored thereon a data structure, the data structure comprising a

first field having data indicative of begin time, a second field having data indicative of an initial progress value, a third field having data indicative of an end time, a fourth field having data indicative of an final progress value, and wherein a current time between the begin time and the end time is used to interpolate a progress value between the initial progress value and the final progress value.

The Office action rejected claim 27 as being unpatentable over Milne in view of Cheng. More specifically, the Office action cited the same sections of Milne and presented the same rationale for rejection as was presented previously with respect to claims 1 and 3. The Office action acknowledges, however, that Milne does not teach a data field for data to interpolate a progress value. However, the Office action contends that Cheng does teach this recitation and that the combination of Milne and Cheng would be obvious to a person skilled in the art at the time the invention was made because smoother animation results. Applicants respectfully disagree.

Applicants submit that the Office action has failed to establish a *prima facie* case for obviousness. Not all of the recitations of claim 27 have be shown to be taught or suggested by the prior art of record. Specifically, as discussed above, interval data is a concept that is neither taught nor suggested by the prior art of record. In claim 27, interval data is expressed as an interpolated value between begin time and end time while taking into consideration current time and current progress. Milne, whether considered individually or in conjunction with any other prior art of record including Cheng, fails to teach or suggest the concept of interval data. That is, the prior art of record cannot be construed to teach a data structure

comprising fields for begin time, initial progress value, end time, and final progress value as used herein and consistent with the art. Applicants submit that claim 27 and dependent claim 28 are allowable over the prior art of record for at least the foregoing reasons.

Turning to the last independent claim, amended claim 29 recites in a computing environment, a method comprising generating an event list based on scheduled events and at least one interactive event, computing an interval list based on the event list, determining a current interval in the interval list based on a time value, wherein the interval data corresponds to a relative determination of time between a first event and a second event, and processing data associated with the current interval to produce an output based on the time value.

The Office action rejected claim 29 as being unpatentable over Anderson. More specifically, the Office action contends that Anderson teaches generating an event list based on scheduled events and at least one interactive event. Fig. 19 and column 28, lines 5-12 of Anderson are referenced. Further yet, the Office action contends that Anderson teaches determining a current interval in the interval list based on a time value. Fig. 18 of Anderson is referenced. Finally, the Office action contends that Anderson teaches processing data associated with the current interval to produce an output based on the time value. Again, Fig. 18 of Anderson is referenced.

The Office action acknowledges that Anderson fails to explicitly teach interval data and by implication the recitation of computing an interval list based on the event list. However, the Office action contends that Anderson implicitly teaches

interval data because sequences of events are associated with node numbers. The Office action concludes that a person skilled in the art at the time the invention was made would have found the recitations of claim 29 obvious because organization of events in a list is desired. Applicants respectfully disagree.

Applicants submit that the Office action has failed to establish a *prima facie* case for obviousness. Not all of the recitations of claim 29 have be shown to be taught or suggested by the prior art of record. Furthermore, claim 29 has been amended to further distinguish that which applicants regard as their invention over the prior art.

Anderson is directed, generally, toward a process for generating 3-D graphics in a movie scene or computer-based animation sequence. More specifically, the cited sections of Anderson describe a number of events that may occur during an animation sequence and provides for start times with regard to these events. Thus, a character may run, walk, change costumes and faint according to a specific schedule of events. However, as conceded by the Office action, Anderson does not teach the concept of interval data.

In contrast, claim 29 recites computing an interval list based on the event list and determining a current interval in the interval list based on a time value. Interval, as used herein and consistent with the art describes non-overlapping segments of time as expressed by a given clock a different points in time. As has been discussed above, the actual timing unit of measure is irrelevant as the interval between events is measured as a difference between the measure at the first event and the measure at the second event. Thus, if the timing of any graphics

subsystem is interrupted, the animation will remain smooth because the timing of events is based on intervals and not based on the passage of time. This results in smooth animation absent jumps, blips and the like. Anderson is not directed toward assuring maintenance of playback time or assurance of smooth animation. Applicants submit that claim 29 is allowable over the prior art of record for at least the foregoing reasons.

Applicants respectfully submit that dependent claims 30-36, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 29 and consequently includes the recitations of independent claim 29. As discussed above, Anderson fails to teach or suggest all of the recitations of claim 29 and therefore these claims are also allowable over the prior art of record. Even when additional prior art is introduced, such as the case with Cheng and Milne, the prior art of record, whether considered as individual references or in any permissible combination with each other, still fails to teach or suggest the recitations of claim 29. In addition to the recitations of claim 29 noted above, each of these dependent claims includes additional patentable elements.

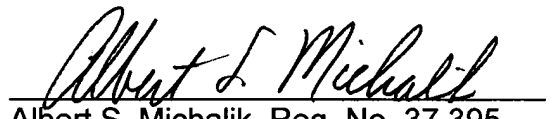
For at least these additional reasons, applicants submit that all the claims are patentable over the prior art of record. Reconsideration and withdrawal of the rejections in the Office action is respectfully requested and early allowance of this application is earnestly solicited.

CONCLUSION

In view of the foregoing remarks, it is respectfully submitted that claims 1-36 are patentable over the prior art of record, and that the application is in good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that this Amendment, Transmittal and Petition for Extension of Time, are being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450.

Date: April 3, 2006

Albert S. Michalik

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